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☆ THIS MONTH ☆

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WELLINGTON BRINK

Editor

Art Work by

W. HOWARD MARTIN

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SMART BANKING.—The Bank of Saline in Louisiana believes in conservation farming. Recently the bank presented 22 farmers with subscriptions to SOIL CONSERVATION Magazine.

Saline, in the Saline Soil Conservation District, is the center of a small farming community. Cotton used to be a big crop, but severe erosion took its toll on the sandy, sloping land. Farmers started to apply soil conservation practices. Cattle, pine timber, and truck crops have now become major sources of income for Saline farmers.

Coordinated conservation farming is paying off in the Saline area in greater income and better living.

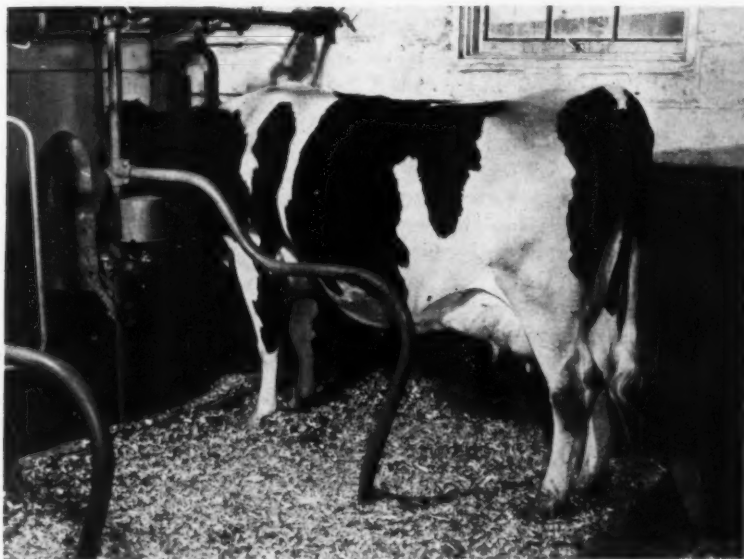
—O. O. MOORE.



FRONT COVER.—The shape of farming in Winona County, Minn. In foreground are contour strips of alfalfa, corn, and oats on the farm of William Thieke. Farther back may be seen the farms of Albert Thieke, Verran Ninteman, and Casper Ninteman. This is in the Pea Ridge section.

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PORTABLE WOOD CHIPPERS HAVE VARIETY OF USES



Wood chips used for dairy bedding at the R. M. Carpenter farm, New Castle County, Del.

By **ARTHUR C. McINTYRE** and
MATT MIRANTZ

THE price of straw is of no serious concern to Bill and Avery Pulver, dairymen of Stanfordville, N. Y. During the 180-day barn season of 1949-50, they saved themselves more than \$24 per ton on 250 tons of wood-chip bedding used for their herd of 56 milkers.

The cost of the bedding ran \$5.90 per ton. Bill Pulver says that the cows much prefer it to straw. They lie down in it immediately after milking.

"When I tell you that straw sells for \$30 a ton around here, you can see that we won't have to run this chipper much longer before it has paid for itself," Bill observes.

That's only part of the story. Under their old cropping system, the Pulvers were using most of their cash to buy hay and grain and were scarcely more than keeping their heads above water. Shortly after the Dutchess County Soil Conservation District was formed in 1947, the brothers

became "cooperator number 3" and asked the district for help in making a complete conservation plan.

Bob Thornton, SCS representative then assisting the district, suggested that the 810-acre farm of hills and woods ought to be devoted largely to hay, hay-crop silage, and pasture. Up to then the emphasis had been on corn silage and oats for straw, and there had been too little hay. Grass and legumes were needed to build up the farm's fertility and hold the topsoil where it belonged.

But without oats, bedding loomed as a problem until Bill Pulver realized they were paying taxes on 411 acres of woods and getting very little in return. They had seen a wood chipper demonstrated and managed to locate an old one which they bought for \$450.

Once their trees are marked for selective cutting, the Pulver brothers hire a man to cut them in 8-foot lengths for \$5 a cord. It costs another \$5, the brothers estimate, to haul the wood to the barn in their home-made cord-capacity trailer, their horse-drawn sled, or their stake truck, and get it through the chipper. The chipper is mounted at one end of the barn alley. It takes 3 gallons of gas

NOTE.—The authors are, respectively, regional forester and information specialist, Soil Conservation Service, Upper Darby, Pa.

to get belt power for chipping 1 cord, plus \$12 to sharpen the chipper knives every 10 cords—a total of \$11.80 per cord. There are 2 tons of bedding per cord.

In 1949-50 the Pulver brothers used 125 cords of wood, chipping twice a week. They found that green wood chipped easier, but that seasoned stuff made finer chips, so they'll keep on using whatever is handy. As they don't store any, they have no worries about heating.

Thirty-six and a half acres, all but $3\frac{1}{2}$ in hay, got the benefit of 8 tons of chip manure every day last winter. The Pulvers especially like the way the stuff clears out of a spreader and sifts into the soil after a rain. Unlike straw, it doesn't stay on the surface.

"By selective and improvement cutting," says Bill, "we are making room for the best trees to grow, and this will give us saw timber in time. Then, too, our new system gives us all the hay and silage the herd will eat—and we've got 108 head, all told.

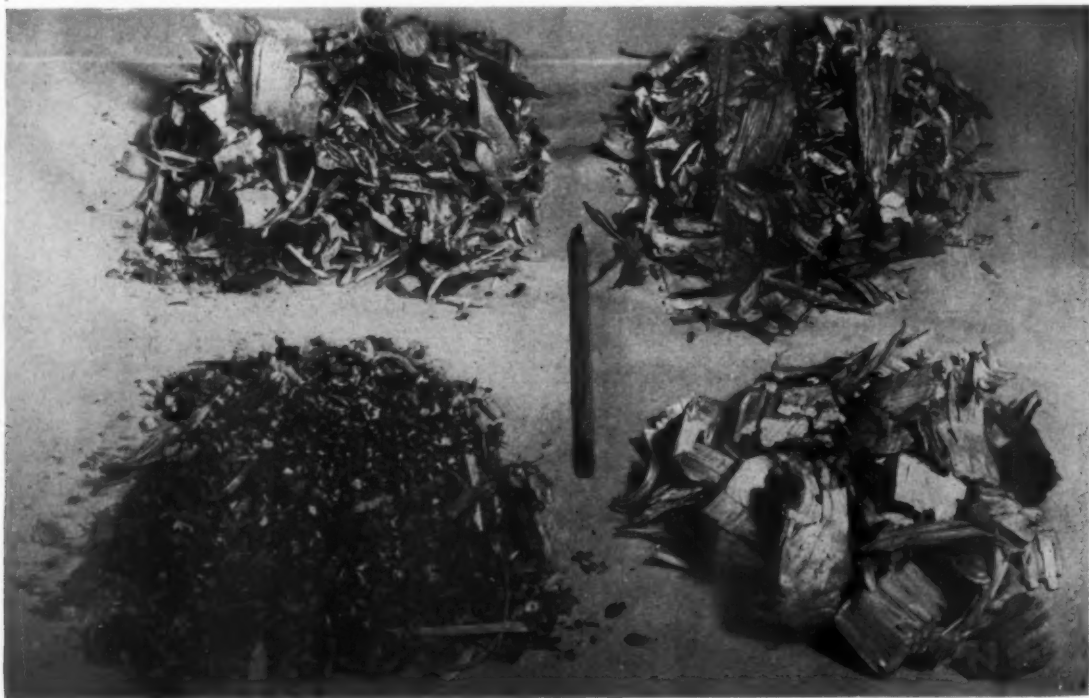
"Chips don't mat in the stalls like straw, and don't give off any dust. They're the easiest material for our type barn. They are cleaner to han-

dle, and when there's some cedar in them, they even give a pleasant smell to the barn."

By using wood chips or shavings as bedding or mulch, dairymen, orchard owners, and vegetable growers will find a material that is cheaper than anything else available, including home-grown straw. Wood chips handle easily going in and out of the barn, move evenly from a manure spreader, provide long-life organic matter for the soil. The chips are taken from wood that has very little value.

Fred W. Cornwall, owner of the Shore Acres Fruit Farm, Pultneyville, N. Y., gets rid of his orchard prunings by moving his new chipper through the orchard, spewing chips among the trees as a mulch with the cover crop. Being able to clear the ground before the spraying season starts is quite an item on the farm because brush left on the ground tangles in the sprayer. With the new chipper, two men can take care of the brush program before the sprayers come on. Before, two crews were needed, one for spraying and one for clearing brush, carrying it out of the orchard and tending a bonfire while it burned.

"The only thing we take out of the orchard now,"



Size is important. The representative sizes here, proceeding clockwise from lower left, are for dairy bedding, for poultry litter, for mulch, and for soil amendment to be plowed under.

says Cornwall, "is the fruit. All grass, leaves, and now these chips stay as mulch."

Many farmers prefer wood materials for bedding, but most complain, "Sure, but the sawmills either move too fast or too far." The arrival of the portable wood chipper has ended that argument.

When an acute shortage of dairy bedding in northern Vermont occurred during the winter of 1949-50, farmers in Lamoille County made 100- to 200-mile round trips to New Hampshire mills for sawdust. These stockpiles are going fast and the directors of the Lamoille County Soil Conservation District foresee an even worse shortage ahead.

At the same time, they noticed that local mill owners were burning their waste slabs. While lumbermen were interested in getting something for their waste, they didn't want to spend the time or the money to experiment. But the directors did. They went to a Massachusetts manufacturer with their problem and got a chipper designed that will take slabs up to 12 inches wide and 4 to 5 inches thick. Pending delivery, to tide the district over, the company loaned one—power take-off drive—that will take 6-inch slabs. The supervisors plan to rent the machine to cooperators for \$5 an hour, which will include the services of an operator. Sawmills will deliver slabs within a radius of 4 miles for \$1 a truckload, and next year cooperators of the Lamoille Soil Conservation District won't be making those long trips. Although the machine is built for slabs, it easily will handle wood-lot thinnings, and requests are already coming for the machine to chip these.

Easily towed by jeep or truck, or mounted on a tractor, a chipper can move right into a wood lot and make bedding out of everything from poles to twigs. It makes no difference how gnarled, knotty, or twisted they may be. If this arrangement doesn't suit, the chipper can be set up near a storage bin, the wood brought to it, and the chips blown directly into storage ready for spreading in the barn.

Each year farmers lose tremendous quantities of wood because trees are not harvested. The wood chipper can make every wood lot a source of bedding, and at the same time improve it by removing cripples and thinning to increase growth rates.

Without conflicting with the sale of pulpwood or saw timber, the chipper uses thinnings, limb wood, and tops left after logging operations are



The SCS nursery at Big Flats, N. Y., uses wood chips for mulch to produce better trees, shrubs, and other plants. It applies a minimum of 82 tons per year on 10 acres. C. N. Clement, manager, examines chips that have been spread for plowing under.

completed. At the same time, the lot is cleared of highly inflammable brush tangles.

Now, using wood chips for bedding is nothing new. It's the size and shape of chips that count. The amount of surface, more than the material itself, is the prime factor in how much it will absorb. And a pile of wood chips has plenty of absorbing surface.

Wood chips make a good blotter. A cord, or 128 cubic feet of coarse sawdust, will hold about 2,000 pounds of urine, which is as good as or better than the performance of straw. That becomes important when it is noted that nearly half the nitrogen and three-quarters of the potash in manure is in liquid form. Manure is 80 percent water by weight, and this 80 percent contains the most quickly and readily available plant nutrients.

Farmers use from 6 to 20 pounds of shavings or sawdust per cow per day. The smaller amount will absorb all of the liquid manure and still provide a clean bed. If 10 pounds are used, the manure is about 15 percent wood by weight. Most farmers prefer this liberal amount because it gives a more comfortable bed and also provides more organic matter for the soil.

"What will chip manure do to the land?" farmers often ask. Many State research stations have reported on the matter, and the summary of their findings is that woody manures are as good as any other kind, and sometimes a bit better.

At Rhode Island's agricultural experiment station, woody manures were spread at the rate of 3 to 4 cords per acre for 18 years on fields in a three-crop rotation. The report: Just as good as the fields where straw manures were used.

At Vermont they found that woody manure piles heated up no more than those piles in which the bedding material was mature hay. The Vermont workers also shattered the old wives' tale that "Wood makes soil sour." All plant ashes, they point out, are alkaline.

In January 1950, an on-the-spot test of a sample of woody manure on the Carlin Brothers' farm in Chester County, Pa., showed an average pH of from 6 to 6.5.

All farmers know that crop yields are sometimes reduced when organic matter is put on the soil. Wood is as much organic matter as hay or straw, and should be treated with nitrogen. Dr. O. J. Attoe, of the University of Wisconsin, recommends 50 pounds of ammonium nitrate or 75 pounds of ammonium sulphate per ton of bedding material. As much as 20 tons of woody manure per acre has been handled successfully when supplemented with nitrogen fertilizers, he adds.

The question of how much of this wood-chip bedding will be needed for any one year is easy to answer. In a dairy herd of 20 head, using 10 pounds of chips per animal per day for 210 days, the year's barn requirements would be 42,000 pounds. An average cord of wood weighs about 4,000 pounds. Dividing, we find that about 11 cords, or just a little more than half a cord per animal per year, will fill the bill.

Woody manure helps loosen up heavy soils. This makes for better aeration and allows more water to enter and move through the soil, promoting root development of crops. On sandy soils, woody manure improves water-holding capacity.

James Chadbourne, vegetable grower of North Bridgton, Maine, won a free dinner several years ago by raising the pH of a piece of land from 5 to 6.3 with a sawdust and nitrate treatment. A neighbor had bet that he couldn't do it without lime.

In Sharon, Mass., the Moose Hill farm chips brush and tree limbs in land-clearing jobs. Chips are blown back to cleared areas as mulch. In orchard work they are blown around the base of trees. Knives need sharpening after 30 hours' work.

Hilly and stony conditions at J. W. Hulbert's Nobscott Mountain orchards near Farmingham, Mass., sharply limit use of brush hooks and other brush- and limb-disposal devices, but a chipper does the whole job quickly and effectively. Hul-

bert chipped the trees and brush cleared from a large area, where burning was barred as a fire hazard. He got the chips for use in his orchards. Four men carried the brush to Hulbert, who fed the machine. It was run at half-throttle and used about a gallon of gasoline per hour. Chipper operations are more efficient than burning and end the fire hazard, the foreman said.

Cheever Newhall, manager of the 100-acre Pinacle Farm orchard in New Hampton, N. H., chipped the prunings this year. With the machine it took three men 2 weeks to do a job that required the services of six men for 3 weeks last year. Elimination of a fire hazard that caused a lot of trouble in 1949, increases the value of chipper service, Newhall said.

In Connecticut, Charles A. Bartlett, of Somers, does custom and contract work with a chipper mounted on a jeep. Some customers use the chips to bed their farm animals; others use the chips for mulching. Bartlett charges \$5 per hour for the services of the chipper and an operator.

The Maryland State Conservation Committee has bought a chipper for the use of the cooperators in 23 Maryland soil conservation districts. In the Northeastern States more than 100 chippers are owned and operated by farmers or are available for the use of farmers.

Portable wood chippers are becoming available for farmers. They are made either with their own 30-horsepower gasoline engine, or the head alone can be purchased and operated from a power take-off. At present their comparatively high cost—from \$800 to \$2,000—prohibits ownership except by organizations such as soil conservation districts, or by custom operators.

STRAWS IN THE WIND.—Seed dealers in the Wiregrass Soil Conservation District are bragging about how many small seeders they're selling, according to T. G. Amason, district conservationist at Ozark, Ala. Amason said one dealer told him he sold 20 hand-operated, whirling-type seeders in 3 days. When Amason told another dealer about this the second dealer said, "That's nothing, I sold 4 dozen in 2 weeks and had to wire for an additional supply."

Amason also reports that there are now six or eight cultipackers in each of the six counties in the district whereas cultipackers were almost unheard of in that area 3 or 4 years ago.

"The seed dealers in general seem to be doing the best job they have ever done with their customers, encouraging them with proper land preparation, proper fertilization, and correct land use with soil conserving crops," said Amason.



Steep-sided ridge typical of McGregor watershed.

DAMS SAVE McGREGOR

By W. H. LATHROP

ON June 14, 1950, 6 inches of rain fell on McGregor, Iowa, in 3½ hours. Two and a half feet of water flowed down the main street. Silt piled on lawns and the storm sewer was damaged. The total cost to the town was about \$1,000.

Afterward, townspeople surveyed the flood litter. They were in an amiable frame of mind. Common comment was, "It's a good thing we had the dams."

McGregor folks haven't always been so relatively cheerful after a heavy rain. This Mississippi River town is in the narrow outlet of a 2,500-acre watershed. Old timers, and many not so old, recall when heavy rains sent 6-foot torrents down Main Street, flooding houses and stores. They recall streets and sewers filled with silt and rocks even after minor floods, and autos washed into the Mississippi. Before 1937 five floods in 20 years averaged more than \$50,000 damage each. But that was before conservation came to the watershed.

When the watershed became a demonstration project in 1935, McGregor businessmen asked the Soil Conservation Service for help with the flood



An old print of 1934, in which a car is shown being washed down the main street of McGregor.

problem. The plan that resulted called for a complete soil and water conservation program on the drainage area above the town and construction of detention dams to catch excess runoff water.

Under this program, up-and-down-hill farming in the watershed gave way to winding strips. More land is in grass, less in tilled crops. "Watch for the strip cropping when you go through the McGregor area," is standard advice to summer motorists. The town has purchased timberland in the watershed, which is protected against grazing.

The retention dams, designed to store and discharge runoff from a 50-year rain, got their big test June 14. Rocks up to 200 pounds were piled above the inlets. Some railroad tracks were washed out. No one ventured an estimate of the damage that would have been caused without the flood-control and soil conservation work.

NOTE.—The author is information specialist, Soil Conservation Service, Milwaukee, Wis.

"THE EARTH IS THE LORD'S AND THE FULNESS THEREOF"

By W. O. LAMBETH

ONE of the four great churches in rural America! That's what 100,000 ministers called Olive Chapel Baptist Church, Route 3, Apex, N. C., in 1949. In an interdenominational poll conducted by the *Christian Century*, this church was selected as the rural or small-town church most worthy of study in the southeast quarter of the Nation.

What has made this country church great? Many factors have contributed. Sturdy Anglo-Saxon pioneers settled in the community around 1740. Poor, but descended from good, sturdy stock, they were unshaken in their determination to wrest a livelihood from the soil. Land on the ridge between the Haw and Neuse Rivers where they settled sold for 6 cents an acre. The more fertile land in the valleys had been taken long before.

The first church in the community was organized 100 years ago by direct descendants of the original settlers. The first school was established soon thereafter, and the minister taught in a building on the church grounds. Today, many of the descendants of those first staunch settlers still farm in the community. The farms are small, but the fertility gradually has been built up.

Dr. Ralph Felton, of Drew Theological Seminary, Madison, N. J., found in a survey that 70 farmers in the community had an average gross income of \$5,322 in 1946. The average would probably be considerably higher today.

A former pastor, the Reverend Garland A. Hendricks, can look with pride on the honors that have come to this church. To him it is the fulfillment of a plan made 7 years ago. The Reverend Mr. Hendricks came to Olive Chapel Church in 1943 and remained there until November 1, 1950, when he left to begin a new venture in student-adult education as head of a department of Church-Community Development at Gardner-Webb College, Boiling Springs, N. C. Soon after assuming the pastorate, he inaugurated a well-planned program of church activities. Although deeply and primarily concerned with the religious welfare of the

people, he found time to engage in all community activities that would tend to develop his church members mentally and physically. In fact, due to his energetic efforts, the church has been the center of community life.

The Reverend Mr. Hendricks has always been vitally interested in how his members use their leisure time, as well as the way they till their soil. He decided early in his pastorate to do something about the raw gullies and red hillsides that were present on every farm. It did not seem to him that the one-crop system of tobacco farming prevalent in the community was putting the Lord's land to the purpose for which it was intended.

"What does it profit a country community," he reasoned, "if its people work and accumulate large tracts of land and bank accounts and forget that 'the earth is the Lord's and the fulness thereof, the world and they that dwell therein?'"

In 1944 he preached a regular Sunday morning sermon on soil erosion, pointing out that his members were not being faithful stewards of the soil if they permitted their fields to wash away and become unproductive. After this Sunday morning service, a farmer in the community who had been accustomed all his life to lifting his plow across gullies was heard to say, "I'll never see another gully without thinking someone has committed a great sin."

The Reverend Mr. Hendricks continued to preach and talk about the duties of faithful stewards to conserve the land. He continued to list mining and wasting the soil among the sins, and to exalt the virtues of conservation farming. This message he carried vigorously throughout the entire 70-square-mile community.

Farmers of the community use the help of the Neuse River Soil Conservation District. Their land-use plans are fashioned to take carefully into account the capabilities of the land. At the present time, practically every farmer has applied sound conservation practices. Among these are strip rotations, contour tillage, terraces, cover crops, pastures, woodland improvement, crop rotations, planting kudzu and sericea, and making wildlife borders and ponds in accordance with district recommendations.

NOTE.—The author is district conservationist, Soil Conservation Service, Raleigh, N. C. Photos by R. W. Stephens, Raleigh News & Observer.



The debt-free brick Olive Chapel Church has 9 acres of landscaped grounds, including an athletic field; a fully equipped two-story community building with kitchen, dining hall, Grange assembly room, and game room; a modern two-story parsonage; and a four-room cottage for the sexton.

The Olive Chapel minister delights in telling the story of the farm progress made by many members of his congregation. "Some time ago," he said, "I was in Apex about 9:30 one morning and saw one of my members cross the street. I saw that he was dressed up, so I asked him where he was going. 'Oh, I'm going to the sale to buy some cows,' he replied. I hadn't heard of any livestock sale so I asked where it was being held. 'Chicago,' he answered, 'I'm on my way to the Raleigh-Durham Airport. I'm flying up.'

"Well, he flew to Chicago, bought 16 fine Holstein cows, arranged for their shipment to North Carolina, flew back, and slept in his own bed that night.

"This same farmer—H. M. Olive—now a supervisor of the Neuse River Soil Conservation District, was a cotton-and-tobacco farmer back in 1934-35. He owned 85 acres of land, and the farm supported 5 people. Today 125 acres are providing a livelihood for 22 people. He grows no cotton and only a small acreage of tobacco, but he has 40 acres of permanent pasture and is milking 30 cows. He has seeded to grass all low, wet areas in his fields and is using them for meadow strips. His average tobacco yield has increased from 700 to 1,800 pounds per acre. As a result of conservation farming, he is also growing 100 bushels of corn to the acre on land that formerly produced only 15 bushels.

"Carl Goodwin, who lives just across the road from the church, has built three fish ponds, two of which are well stocked with bluegill and bass. Carl has 20 acres of bottom land seeded to Kentucky 31 fescue and Ladino clover for permanent pasture. This pasture supports 12 head of cattle. He didn't have to feed a bale of hay all last winter.

"One of the deacons in the church is J. Gordon Olive, former work unit conservationist for the Soil Conservation Service in Wake County and now holding the same position in adjoining Lee County. Olive has supported my efforts to establish conservation by planning the farms according to the capabilities of the land. He has not only helped me preach conservation of our land, but he has shown the way to other members of the congregation by his own farming methods. He has one of the best herds of Angus cattle in the county. Those cattle graze Ladino clover and Kentucky 31 fescue on hillsides that used to produce 15 to 20 bushels of corn per acre."

The 37-year-old minister could tell of countless

other members whose greatly increased incomes have enabled them to contribute more to the support of the church. It is a remarkable fact that the 555 members have contributed a yearly average of \$13,400 for all church purposes during his pastorate.



The Reverend Mr. Hendricks.

Mr. Hendricks' boundless energy and enthusiasm have made it possible for him to work actively in all endeavors designed to promote better living. Yet he has found time to do a lot of reading and research on rural problems. He has served as chairman of the Apex District School Board, taught a class in rural-church administration at Wake Forest College, written a column for a bi-weekly newspaper, served as State Grange chaplain, and as chairman of the Rural Church Committee of the Baptist State Convention in 1947. He attended the Baptist World Alliance at Copenhagen, Denmark, in 1947, and studied rural life in Denmark, Sweden, Norway, England, Scotland, Holland, Belgium, and France. He was named North Carolina's Rural Minister of the Year by the *Progressive Farmer* in 1948. A narrative history of the church, entitled "Biography of a Country Church," was released October 1, 1950, during the centennial celebration of Olive Chapel Church.

This debt-free brick church, built at a cost of \$45,000, could not be replaced now for less than \$100,000. It has 9 acres of beautifully land-

(Continued on next page)

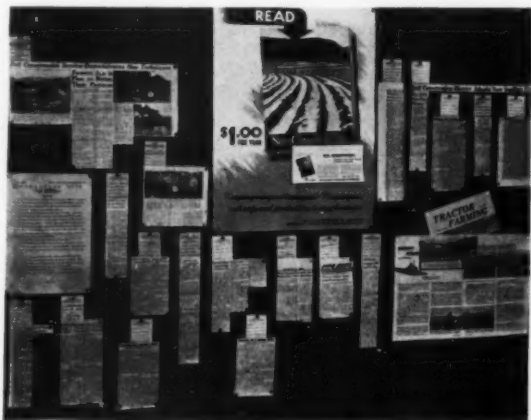
DISTRICT WORK LOWERS TOWN DEBTS.—Efficient use of labor-saving highway machinery in cooperative work with the Steuben County (N. Y.) Soil Conservation District, has been an important factor in wiping out or reducing town debts. For these services during 1949 and 1950, the district has paid \$25,747.88 to 16 Steuben County towns.

What this cooperative service means to these Steuben towns is demonstrated at Bath, county seat, where two district checks totaling \$7,720.69, placed Bath in the select group of tax-free townships for the first time in 10 years. The checks represented work done on about 100 farms. Wiping out the debt was accomplished in the face of ever-increasing postwar operating costs and machinery certificates exceeding \$50,000.

Steuben, like Alleghany, places a lot of operating importance on its heavy-equipment program. The districts own or control many pieces of equipment. In addition they utilize State, county, and town equipment, plus the services of private contractors who have lots of machinery. It was a heavy-equipment program that enabled the Alleghany district in June 1949 to build an average of a pond a day straight through the month. Alleghany had 29 pieces of equipment available to cooperators during 1949. Seventeen were owned by the district and 12 were on loan from local and county sources and from neighboring districts. This array of equipment represented an investment of more than a quarter million dollars.

Towns do not receive the same rate of pay that private contractors receive for use of equipment. The rates for State, town, and county equipment are set by the State Department of Public Works and the Office of the Comptroller of the State. In general these rates are about 25 percent lower than the rates charged by private contractors.

District payments made to the town of Bath for use of equipment from 1946 to 1950 total \$8,289. During the same years Pulteney received \$8,809 and during four of these years Hartsville was paid \$9,791.



New poster issued by Superintendent of Documents, which publicizes this magazine, holds center of bulletin board in regional office of Soil Conservation Service, Upper Darby, Pa.



The late Albert S. Goss.

PASSING OF GREAT FARM LEADER.—Albert S. Goss, Master of the National Grange since 1941, died of a heart attack a few minutes after speaking on the New York Herald Tribune Forum, October 25.

Born and educated on the west coast, he engaged in milling and farming, operated a rural telephone business and country store. As he acquired experience and a reputation for unusual ability, his services were in increasing demand. For more than 30 years he worked in administrative capacities in cooperative associations, in rural banking, and in the Grange, both State and National. One of the things on which Goss insisted as Land Bank Commissioner (1933 to 1940) was that appraisers consider how the soil is being cared for before a loan is made. He was a strong advocate of a livestock-grass economy, and a consistent and effective advocate of soil conservation. He was a director of Friends of the Land.

Hugh Bennett, Chief of the Soil Conservation Service, cut short a field trip to return to Washington for the funeral, in which he was an honorary pallbearer.

"The Earth Is the Lord's and the Fulness Thereof"

(Continued from preceding page)

scaped grounds, including an athletic field; a fully equipped two-story community building with kitchen, dining hall, Grange assembly room, and game room; a modern two-story parsonage; and a four-room frame cottage for the sexton.

Standing in the doorway of the church on the day of the centennial celebration, the Reverend Garland A. Hendricks could look eastward to the green pastured hills and fields of growing crops and see indeed a promised land.

Institute Dealt With Beef and Grass

By W. H. LATHROP

FIVE thousand Iowa and Minnesota farmers gathered at Albert Lea, Minn., one day last fall to attend what was probably the country's first institute on beef cattle and grassland farming. They came to see displays and listen to discussions on soil conservation and beef production. But mostly they came to hear Jake Sells and Bill Darbyshire, practical Minnesota and Iowa farmers, tell their own first-hand experiences in producing more beef at less cost with grass.

The attentive crowd overflowed the large institute building and spilled into a hall nearby where extra slides and microphone relayed the program. It studied charts and exhibits in the "clinic" building and joined groups to look at the pens of live feeder and fat cattle. Each event meshed with that succeeding, and when the day was over many were surprised that it was time to leave.

The Iowa-Minnesota Beef Cattle and the Land Institute succeeded primarily because it presented usable information. But into this smooth-running program went careful planning and a lot of just plain hard work.

The idea was born nearly 2 years ago when Mel Cohee, of the Soil Conservation Service at Milwaukee, sought methods to encourage greater utilization of forage and hay produced by the longer rotations called for in soil conservation farm plans. The natural solution would be increased production of beef and dairy products and sheep at lower cost. The idea was sound and he believed others would be interested.

(Continued on page 134)

NOTE.—The author is an information specialist, Soil Conservation Service, Milwaukee, Wis.



Grass

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GRASS STANDS

PASTURE FOR BEEF PRODUCTION

COMPOSITION OF



100% WHEAT



Cohee took the problem to Chicago meat packers, the logical industry to promote increased beef production. First he saw Jerry Thorne, vice president of Wilson & Co. Cohee outlined his plea for greater emphasis on good land-use and forage-consuming-livestock programs. Thorne offered help in trying a new kind of school for farmers in the Albert Lea trade area of Iowa and Minnesota. This is an area of the Corn Belt where soil conservation leans heavily on crop rotations with more legume-grass meadows. Here was a natural place to try a program with a new emphasis on land use and quality-beef production.

PICTURES ON PRECEDING PAGES

1. Maps, charts, enlargements, samples of feed and grass, were used at the clinic to explain all details of the Sells and Darbyshire soil conservation programs.
2. Acting Minnesota Extension Service Director Rutford made the keynote address.
3. Master of ceremonies was J. C. Holbert, president of the Iowa Beef Producers Association.
4. They conducted a panel discussion on grades of feeder cattle. Left to right: W. R. Morris, extension livestock specialist, Minnesota University; Rex Beresford, extension specialist in livestock marketing, Iowa State College; Les Doran, of Central Livestock Order Buying Company; and Floyd Snell, of the Peterson Sheep and Cattle Company.
5. They planned the clinic: William Zmolek, Iowa State College; Herb Flueck, Soil Conservation Service; William Imlau, Iowa State Department of Agriculture; Louis Larson, Minnesota State Association of Soil Conservation Districts; Elmer Miller, SCS, of Albert Lea, Minn.; Frank Mendell, SCS, Ames, Iowa; and R. E. Jacobs, of Albert Lea.
6. Iowa and Minnesota farmers listened attentively as Bill Darbyshire and Jake Sells told how grass and beef production fits into their soil conservation program.
7. At information booth in clinic building, County Agent R. E. Jacobs (third from right) and his staff answered questions; farmers signed up for bulletins.
8. At the clinic farmers examined samples of grasses, some old and some new.
9. Harold Shold, district conservationist, Storm Lake, Iowa, explains Bill Darbyshire's pasture methods at the institute clinic.
10. Hay samples under discussion: Melville H. Cohee, chief of regional project plans division, SCS, Milwaukee; Cliff Cairns, livestock division, Wilson & Co.; Herbert A. Flueck, Minnesota State soil conservationist.
11. Prize-winning Angus steer, marked to show cuts of beef.
12. Grass and pasture exhibits.
13. Elmer Miller, work group leader at Albert Lea, demonstrated runoff from hard-farmed and virgin soil at the institute clinic.

As details began to take shape, it became clear that the interests of many agencies were involved. A full effort would need full participation. An organization meeting held at Albert Lea in April was attended by 55 persons, representing the Iowa Beef Producers Association, the Minnesota Livestock and Breeders Association, the Iowa Farm Bureau Federation, the Minnesota Farm Bureau Federation, the Iowa and Minnesota Agricultural Extension Services, the Iowa and Minnesota Associations of Soil Conservation Districts, Wilson & Co., and the Soil Conservation Service. Cliff Cairns, of Albert Lea, was chosen general manager of the institute.

A seven-man executive committee accepted responsibility for the institute program. A clinic committee was appointed to plan exhibits and demonstrations. A publicity and information committee was assigned the job of getting news out to the farmers and all others who might be interested.

Even before organization there had been some actual spade work. Two farmers with representative soil conservation programs that included beef and grass had already been chosen—one in Iowa, one in Minnesota. They were selected by a group from the several sponsoring agencies after visiting some 30 farms in the 2 States. This step was taken in January, so that complete records, including a series of colored slides, could be started when the feeder cattle went into the lots from late-fall and early-winter pasture and cornstalk fields.

Enthusiasm grew as committee workers saw a real short course taking form. Publicity started with the mailing of 10,000 copies of an attractive four-page announcement illustrated with pictures of soil conservation work, the Sells and Darbyshire feeder cattle, and beef carcasses and cuts. Wilson & Co. built bleachers and provided chairs. Fortunately, the Freeborn County fair grounds have unusually spacious buildings.

The Albert Lea Chamber of Commerce arranged for picnic lunches at cost. The Central Livestock Order Buying Co., of St. Paul, furnished feeder cattle for the selection and grading demonstration. Wilson & Co. provided dressed carcasses. On Sunday and Monday before the institute, the clinic committee put up the exhibits. The cattle from the two farms and from St. Paul came to their pens early Tuesday, the day of the institute, September 26. Carcasses were hoisted above the speakers'

(Continued on page 138)

IMPROVED DRAINAGE IN THE IMPERIAL VALLEY, CALIFORNIA



Crops respond. This field of thrifty, profitable carrots typifies the healthy production which follows drainage, leveling, leaching, and other new techniques developed by SCS scientists.

ABOUT 10 years ago a small group of citizens from the Imperial Valley of California visited me in Washington to urge the Soil Conservation Service to help them with their drainage and alkali problems. It was pointed out with no

By HUGH BENNETT

little emphasis that more salt was entering the valley in the irrigation water from the Colorado River than was going out in the drainage water. That, I was told, didn't make the future of the valley look any too rosy, especially since a good many fields had already gone salty (alkaline) and were either out of production or producing only mediocre crops. My visitors didn't leave the impression that they were any too cheerful about the situation. Moreover, they didn't impress me as being any too happy about the tightening-up on farm loans in parts of the valley.

Attempts at drainage hadn't been altogether successful. Methods that had succeeded elsewhere in areas of more homogeneous soil conditions apparently were not everywhere adaptable to the alluvial soils of the Imperial Valley.



Turn on the water and flush out the salt! Allen C. "Ace" Bowen, soil conservationist, who designed the tile system for the field shown under water, shares the obvious satisfaction of Rancher Vernon P. Peck (left) in the way the system performs. Leaching water, which is furnished free by the irrigation district, will remain on this field 30 to 90 days, after which the soil will be ready for cultivation. There will still be some salt in the soil but not enough to hamper crop production. Subsequent irrigations will further reduce the salt content. Peck expects to double his alfalfa yield on this field.

The spokesman of the visiting group said, "You've got to help us."

"How?" I asked.

And the leader's response was, in effect: "With research, if you don't know what to do now. We think you can help us."

I didn't say that we had the answers, but did agree we would look into the possibility of getting some research going on the problem.

A research program for the valley eventually was developed, to be carried on in cooperation with the Imperial Irrigation District.

Early in 1941 a program was formulated, with the advice and assistance of local people. The main objectives were to determine (1) the source of the water causing the drainage difficulties and (2) how to remove excess water and salt from the soil. The program also covered the matters of how to improve irrigation practices and how to reclaim, safeguard, and properly use the land and water resources of the valley. This investigational program got under way in June 1941.

From 1941 to 1945, the research division of the Service worked on the problem of drainage, assisted by technicians from our operations division. A staff consisting of an engineer from the division of irrigation and an engineer and soil scientist from the division of operations of the Service was established to undertake the work. It soon became apparent that new methods would have to be developed and proved before an action program could get under way. Hence, the research phase assumed a dominant role during the first 5 years of work. Thereafter, both divisions worked together in a joint research-operational arrangement with the Imperial Irrigation District.

A soil-drainage survey was started, including soil profile studies extending to depths of 16 feet. Apparatuses were devised for quick underground water-table observations and for recording fluctuations in water tables. Techniques were developed for classifying soil according to ability to transmit water. Laboratory and field experiments were carried out to determine the amounts of water which would have to be drained off in order to keep the water table at a safe level and to leach out the saline materials by flooding. Finally, a tile-spacing formula was developed, checked in the laboratory and field, and put to successful use in designing applicable tile-drainage systems.

In December 1945 Service technicians began co-operating with the district in the preparation of

farm plans. This consisted primarily of planning for farm tile-drainage systems, improving irrigation practices, and developing a crop-rotation and drainage program which would utilize all the land according to capability and need. After the research program had progressed far enough to develop effective methods for drainage we were ready to go ahead with farm planning and land treatment. Through its investigations the Soil Conservation Service was prepared to show farmers what lands could be economically drained, where to place the tile lines so as to provide optimum drainage, and how far apart the drains should be under the different land conditions. In those places where drainage by tiling was not economical, crop rotations with rice helped to condition the land to a point where barley, flax, and other crops could be grown.

The technicians had learned how to determine the hydraulic permeability of the soil—how to locate clay barriers, chart seepage flows, determine artesian pressures, gage the efficiency of existing drains, make quick determinations of saline content of soils, develop plans for proper use of fertilizers, and determine the proper lengths of irrigation runs. These services were of vital importance to the farmers of the Imperial Valley. They were not available except through the Soil Conservation Service, yet without them the farmers of the valley had little hope of reclaiming their alkaline and water-logged lands, nor would loaning agencies continue their investments in the farms.

Since December 1945 the operational staff, with some assistance from research, has prepared farm plans covering a total of 17,505 acres of cropland. These plans provide for tiling about 15,000 acres. To date about 11,000 acres have been tiled, and the balance is in process of being tiled. Some 6,000 acres—more than half of the tiled land—have been leached of excessive salts. The balance has been partially leached or heavily flooded to start the process of salt removal by driving the saline elements downward and out through the tile system. Detailed provisions for soil and crop management and fertilizer application are included in the farm plans. Most of these provisions have been applied to the land. About 11,000 of the 17,505 acres planned were found to be in need of land leveling and improved irrigation and water-management practices. These changes also have been made.



This tile awaits burial 6 to 8 feet under surface. SCS research solved problem of where to put the tile lines, what kind of systems to use, how to cope with hidden "lenses."

The farm-planning program instituted in 1946 has progressed from a modest 160 acres, planned during the first half of 1946, to a present rate of nearly 6,000 planned acres annually. This rate of application appears to be about all that can be accomplished with present manpower. In addition to the work of farm planning and application, 28,485 acres of land have been surveyed in connection with a backlog of 100 applications for farm plans.

The early attempts at tiling land in the Imperial Valley met with only sporadic and mediocre success. Some systems worked, others failed. In places, especially where drainage was interfered with by impervious "barrier clay," crops had failed. Even as late as 1944 and 1945 the general farmer in the valley was not everywhere confident that tiling as a practice was the answer to his drainage problem. Farmers along a belt of land on the northeastern edge of the valley could tile with assurance of success. In the rest of the valley drainage was a hit-and-miss problem. The question in the mind of every farmer contacted in the early days of the program was: Will tiling work? But today the question in the minds of the farmers is: When can I get drainage assistance from the Service?

What has probably done as much for improving drainage conditions in the valley as anything else was the discovery of how to install tile drains so as to avoid the effects of irregularly shaped subsurface lenses of impervious "barrier clay." Instead of laying the tile lines through such impervious material in straight-line arrangement, the tiles were installed so as to avoid these clays as much as possible, or to go through them at the narrowest points. This has done a great deal to remedy or void the impounding of water by the lenses under conditions favorable to the development of saline conditions.

The Imperial Irrigation District does the engineering work included in the farm plans. This staff lays out all tile lines, prepares and deepens open-drain outlets according to specifications, and inspects installation of the drainage systems. Soil Conservation Service does the planning, as stated, and helps with installations when called on. The pattern of operation is set by the farm-plan program. It has been adopted by the Imperial Irrigation District's engineering department, contractors, and individual farmers. Not only are 6,000-odd acres being planned annually, but nearly

14,000 other acres of land are being tiled every year. Thus some 70,000 acres of tilled land have been improved or brought back into productive condition as a result of the Service's activities in the valley.

Accomplishment, in terms of dollars based on increased land values, is estimated as follows, not counting the increasing annual increase derived from the work:

Abandoned land reclaimed by drainage (\$250 per acre)-----	\$10, 830, 000
Virgin wet land reclaimed by drainage (\$250 per acre)-----	2, 000, 000
Cultivated land improved by drainage (\$70 per acre)-----	1, 300, 000
	<hr/> 14, 130, 000

The estimated annual net increase in crop production on the 70,000 acres drained as the result of the Service's work at a minimum of \$30 an acre amounts to \$2,100,000.

Also the intangible values associated with the return of 70,000 acres of sick land to production should not be overlooked. Thus, these formerly critically sick lands are being put on the tax rolls to share the cost of schools, roads, canals, and power lines. Roads, canals, and power lines go past sick lands as well as those on the production roll.

BEEF AND GRASS INSTITUTE

(Continued from page 134)

platform—direct from the coolers—before the crowd arrived.

People came from Wisconsin, Nebraska, South Dakota, Colorado, Oklahoma, Illinois, and other nearby States. The Universities of Iowa and Minnesota sent top-ranking agriculturists. Farm journals and press associations covered the event. Top officials of the Soil Conservation Service were on hand to help, along with those from Wilson & Co. and other sponsoring agencies.

Among the specialists, Bill Darbyshire and Jake Sells upheld their end of the show. Darbyshire, of Rockwell City, Iowa, told how his production of beef had jumped from less than 5,000 pounds in 1942 to more than 28,000 pounds in 1949. He still had 31 tons of hay, 2,872 bushels of corn, and 1,112 bushels of oats on hand at the end of his 1949 operations after turning out 26,400 pounds of pork and 28,800 pounds of beef. One pasture of alfalfa-brome—second-year meadow—brought him \$115

per acre in 1950 with 4 to 6 weeks still to go. His grain feeding accounted for one-half of his summer gains up to September 20 and his pasture for the other half.

Jake Sells, of Beaver Creek, Minn., told how his beef production earned \$60 to \$70 per acre from pasture. With corn he makes about \$50 per acre. He follows a 6-year rotation with 2 years of alfalfa-brome meadow. The first year of meadow goes for grass silage and hay. The first cutting is for the silo. The second year of meadow is pastured as needed and any surplus for this purpose goes for hay.

In his 1950 cattle-feeding program Sells obtained a gain of 515 pounds per steer from October 14 to September 20. The alfalfa-brome pasture accounted for 236 pounds of this gain, the remaining 279 pounds came from late-fall, early-wintering feeds gleaned from over the farm and the grain, hay, and silage. Spread over the total gain of 515 pounds per steer, the cost of feed, exclusive of spring and summer pasture, was 9½ cents per pound, at current market prices for feed.

Tentative plans already are being drawn for a Beef Cattle and Land Institute in 1951.



Further improvements being discussed by Bob Hatch and John Decker.

POND REWARDS INITIATIVE.—When Bob Hatch returned from war and went to farming with his father at Granby, in the Hampshire County (Mass.) Soil Conservation District, he set out to establish a number of conservation farming practices with his own farm equipment and labor. With technical help from Hermon Goodell and Ed Konieczny, Bob took his dad's bulldozer and built a farm pond with one-third acre of surface. He seeded the bank and planted shrubs and trees so that it will become a beauty spot. It serves several useful farm purposes and provides a place to swim and fish.



Self-propelled combine at start of 1950 harvest season on farm of Bailey Brothers, Woodleaf, N. C. A total of 125 acres was reserved for harvesting of Suiter's grass seed this year. This 3-acre field was planted from a grant of seed made by the Middle Yadkin Soil Conservation District; the seed was grown in an SCS nursery and allotted to districts. The yield from the field shown here was 650 pounds per acre.

NEW PLANTS CREATE NEW INDUSTRY

By WILLIAM B. LITTLE

AS SHARP changes come to agriculture throughout the country, new industries are being created. The cleaning and processing of seed of soil-conserving grasses and legumes, for example, has become a business of considerable importance.

Plants and plant residues are playing an increasingly vital role in bringing about safer and more profitable use of our land resources. Thus, a very great need for seed of plants not heretofore grown in quantity has arisen almost everywhere.

Observational plantings of such crops have been made from seed grown in Soil Conservation Service nurseries and allotted to soil conservation dis-

tricts. The Soil Conservation Service has searched diligently, and with a considerable measure of success, for plants to fit definite and often exacting conditions.

Successful trials have resulted in production of seed by farmers, both for increasing their own acreages of needed crops and for sale to others. Such production now adds up to many millions of pounds annually. No longer do a few large seed houses process most of the special crop seed for market; custom plants are being built closer to the source of supply. In some sections there is hardly a rural community without its seed-cleaning plant. A new industry has been born. It has been growing every year since 1935.

In one Southeastern State a conservative estimate based on a survey just completed shows there are now about 165 commercial seed-cleaning plants in operation, contrasted to possibly 10 in use at the time the Soil Conservation Service became a part of the Department of Agriculture. The same survey shows there are over 600 custom processing plants in the nine Southeastern States.

The seed grown in Soil Conservation Service nurseries are of species not readily available

NOTE.—The author is soil conservationist, Soil Conservation Service, Wadesboro, N. C. Information for this article, of a sort not readily available from all parts of the country, has been culled mostly from the nine Southeastern States.

through ordinary trade channels. The nurseries have made it possible to spread rapidly the use of such plants as blue lupine, Suiter's grass (Kentucky 31 fescue), kudzu, and sericea lespedeza. Planned conservation has stimulated the use of soil-conserving crops.

The acreage planted to annual lespedeza has been greatly increased in the last 10 to 12 years. Census figures have it that the seed harvest of this crop in the United States has increased from 43 million pounds in 1935 to 213 million pounds in 1946. In some places it is a vital contribution to the local economy. In Stanley County, N. C., for example, last year's seed crop from annual lespedeza amounted to over a million dollars in value, with prices lower than for several seasons.

The use of blue lupine, especially in Georgia, Mississippi, Florida, Alabama, and South Carolina, for winter cover following peanuts and other crops, has had considerable influence upon the agriculture of those States. In 1950 the crop of blue lupine seed amounted to a little over 148 million pounds in those five States, according to the Bureau of Agricultural Economics.

Some of the native grasses came into their own in 1949. Last year was favorable to the setting of a crop of grass seed in many parts of the country. Of the tall and midseason grasses alone, over 3½ million pounds were harvested. Most of this production was in Texas and Oklahoma. About two-thirds of it consisted of big bluestem, little bluestem, Indiangrass, and switchgrass.

Soil conservation districts in parts of Texas are highly pleased with guar as a plant which fits well into their conservation program. Seed production to extend its use has been expanding since 1948. Acreage of sweetclover continues to expand, especially in the Texas Blacklands.

Throughout the semiarid parts of the Middle West and Southwest an urgent need for drought-resistant plants has been partially met. This job alone required large amounts of seed of adapted plants.

More and more seed requires more and more processing facilities. The story is much the same everywhere.

Since recent demand for seed of especially adapted crops has exceeded the supply, prices have been high. Conservation farmers have profited by growing seed for sale and evidencing the truth in the old adage, "The early bird gets the worm."

There are several reasons why most of the seed-

processing business has been shifted to communities where the seed is grown.

For one thing, the volume has become so great that the cost of shipping to distant plants would be high. A considerable part of the seeds would then have to come back to the general vicinity where they were grown in the first place. Then again, hauling and handling is reduced in many instances by taking the seed directly from the field to the processing plant. In case of sale to the operator of the plant, the farmer often never sees the seed again.

Lastly, but most important, improved harvest methods have been devised to save seed formerly lost by shattering. This means green seed which must be immediately separated or dried in a volume not feasible without prompt access to a processing plant.

With the growing demand for some of the more commonly known plants, plus those introduced especially to fit certain land and climatic requirements, local cleaning, drying, and scarifying plants began to appear. Many operators of these plants engage in buying and selling. The smaller ones usually buy on contract for larger processors or for large seed dealers, and for sale directly to farmers in the neighborhood.

This new industry has been of economic benefit to many people.

Frank Nash, for example, a hydroelectric engineer of Mt. Gilead, N. C., nearing retirement age, became interested in the possibilities of sericea lespedeza. His first seed plot was started from a few plants bought from a neighbor at 1 cent each. Nash, now 72 years of age, does business as the Sericea Lespedeza Growers Association, Inc., and is regarded as leading the field in the processing and handling of sericea lespedeza seed. The products of the Nash plant go into half the States in the Nation. Last year he processed 450,000 pounds of sericea seed alone.

R. P. Stegall started in the early thirties a plant financed with \$500 of borrowed money. He cleaned 40,000 pounds of annual lespedeza that first year. Still doing business at the old but greatly expanded stand at Marshville, N. C., Stegall processed 6 million pounds of annual lespedeza seed last year. This was one of the earliest of custom seed-processing plants, and probably the first south of Richmond, Va.

In one State the Farmers Cooperative Exchange began a business of processing seed and dealing in

seed in 1935. They report growth in value. The first year they did a \$29,000 business in seed. Last year it reached \$2,000,000. Last year's volume of seed in pounds is given as approximately 3½ million pounds of Kobe lespedeza, 140,000 pounds of Ladino clover, 250,000 pounds of sericea lespedeza, and 300,000 pounds of tall fescue.

The practice of taking seed directly from the field to the plant for cleaning and/or drying, while it reduces expense of handling for the farmer, tends to create a congestion often hard to handle. This is greatly aggravated because of the time it usually takes, in at least some States, to get the required purity and germination test before sale. A private, licensed laboratory for making the test partially relieves this bottleneck at Marshville for Stegall and nearby processing plants.

Some of the clovers and other plants continue to bloom after a good seed crop has matured. Since the mature seed must be harvested promptly to prevent loss, there will, of course, be green seed put in the bag also. Such a mixture may heat and be damaged overnight if the green seed and particles of green leaves and stems are not quickly removed. It is usually impractical, when a large acreage is harvested, to prevent heating by spreading. The floor space seldom is available. This means quick and therefore local cleaning, and in many cases drying. For this reason, cleaning and drying plants for doing local custom work are real necessities.

The volume of blue lupine seed produced in some sections of the Southeast would hardly be possible without local cleaning and drying plants. With acre yields up to 1,500 pounds or more, farmers who harvest a large number of acres couldn't prevent heating and loss without such plants.

Crimson clover is being used more widely than ever, and when its seed is harvested in quantity, immediate cleaning is the logical way to prevent heating. Each of several Southeastern States now harvests more than a million pounds of this seed annually.

Several million pounds of wild winter peas, Singletary or Caley-peas, are saved for seed in Alabama and Mississippi. This also requires quick processing to prevent damage to germination from heat.

Tall fescue seed presents the same problem, though not to so serious an extent as some of the others. The volume of this seed harvested, however, has increased very rapidly.

In 1940 the Soil Conservation Service bought 70 pounds of Suiter's grass (Kentucky 31 fescue) from a son of W. M. Suiter, who discovered this grass on his mountain farm near Frenchburg, Ky. This was planted in a Soil Conservation Service nursery. Most of the acreage now planted to this grass in the Southeast has come from the increase of this 70 pounds.

Harvests of Suiter's grass in soil conservation districts this year have been very large. Jones Brothers of Huntsville, Ala., harvested this season 100,000 pounds of cleaned seed. As much as 100 acres harvested by individuals is not uncommon.

Buttonclover is becoming an important seed crop, especially in Tennessee and northern Alabama. One soil conservation district alone reported this year a harvest of 250,000 pounds, and the harvest was still incomplete.

The seed of buttonclover is extremely trashy as it comes from the combine. Facilities for cleaning as combined greatly simplify the harvesting.

Hairy indigo seed is being harvested in considerable quantity in Florida. It makes a good soil-improvement crop in most of the Southern States.

Processing plants today are as common in some sections of the South as cotton gins.

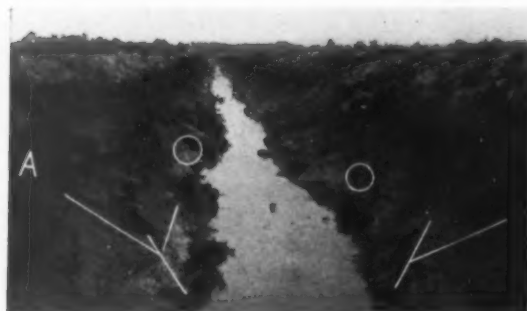
DRAINAGE DITCHES CAN BE EROSIVE, TOO

By WILLIAM A. ALBRECHT

THE loss of much good soil through erosion within a drainage ditch itself is not commonly mentioned as part of the cost of getting rid of surplus water. Ditches must be included as part of the erosion pattern. We have seldom considered how much erosion occurs when running water is working against the resistance to its flow by the creek or ditch banks.

For some estimate of how serious this erosion is, there are available the photographic records taken by Dr. F. L. Duley of the Soil Conservation Service at Lincoln, Nebr. They are of a drainage ditch cut by dredge to straighten the channel of the West

NOTE.—The author is chairman, department of soils, University of Missouri, Columbia, Mo.



In 28 years this dredged ditch cut itself from an original width of 20-25 feet to one of 5-8 rods, while it hauled away from 10 to 15 acres of fertile soil per section of land. It also cut itself deeper, as the circles marking the junction of the soil horizons indicate. (Photos by Duley.)

Fork of the Grand River in Worth County, Mo. The first two photographs were made in 1921 and 1923 looking upstream from the bridge at a point over the center of it. The third view—in 1949—could not be taken from the bridge because the bridge had fallen into or had been washed into the stream long before. Consequently, the left bank had to serve as the point from which to take the picture.

The soil profile of the ditch banks serves to indicate the depth of the water's cutting activities during the 28-year period of our story. The gray soil scattered at the top of each spoil bank repre-

sents the last soil thrown out from the bottom of the ditch during excavation (circles, photograph A). Consisting of more compact material, it was cut by the water to leave more nearly vertical banks than was the case for the soil just above it. The angle of slope, or pile, of the former is much greater than that of the latter (indicated by lines, photograph A). This is readily evident on the nearly freshly cut banks still not yet covered by any vegetation.

That the soil of the spoil banks was fertile is well indicated by the general and dense vegetative cover already well established there, and also on the stream banks, as early as 1923 (photograph B). That the ditch had already cut much deeper by that date is indicated by the top of the water along the two different soil horizons (circles in photograph B) which marked the near bottom of the ditch only 2 years before.

That same transition line in the soil profile, marking differences in glacial soil deposits (circle in photograph C) serves to point out the still greater depth to which this ditch had eroded by 1949. These facts, coupled with the disaster to transportation along the highway by having the bridge fall into the ditch, make the depth of 15 feet and the width of 150 feet tell us in no uncertain terms that serious soil losses are occurring through erosion even within our drainage ditches.

In 28 years the erosion within this ditch has closed a highway. It has cut the ditch from an original width of 20 to 25 feet to one of 5 to 8 rods. It has hauled away from 10 to 15 acres of fertile soil per section of land through which the ditch originally went as a straight line. All this erosion cost says nothing for the additional troubles and increased soil losses impending, now that the stream is starting to meander and to cut so much more severely at irregular points along its line. Erosion by ditches themselves must not be disregarded.

NOTES FROM THE DISTRICTS

PASTURE IN MINIATURE.—A grass nursery plot on city property across from SCS headquarters in Grapevine, Tex., helped the area's revegetation record in 1949 and 1950. More than 1,000 acres of KR bluestem were planted on cooperating farms in this work unit area in 1949 for seed production. Several hundred of acres of Suiter's grass also were planted.

Harold Hart, work unit conservationist, reports that many farmers, after looking at the various grasses, went



Hart pridefully surveys the grass nursery plot opposite headquarters.

to Service headquarters for additional information. As a result, additional acreages were planted and many farmers became cooperators with their soil conservation district.

Employees of the work unit took advantage of inclement weather to install and maintain the plot. The following plants are included: Sulter's grass, orchardgrass, bromegrass, Indiangrass, little bluestem, big bluestem, side-oats grama, weeping lovegrass, buffalograss, KR bluestem, multiflora rose, and Angleton bluestem.

PRODUCER OF MULTIFLORA ROSE.—Interest that sprouted when he watched the development of a multiflora rose planting on his farm as a part of his complete conservation plan, led Glenn Jolliffe, of Knob Fork in the Upper Ohio Soil Conservation District, W. Va., to start production of multiflora as a new farm crop.

Jolliffe made his first plantings last April and May, using some straw but mostly sawdust as a mulch that was raked off as soon as the seed germinated. By mid-August the growth was 20 inches high. A month later it was 30 inches.

Some seeds were planted in rows; others were broadcast in beds. Jolliffe anticipates a production of 200,000 plants this year. He will use some on his farm and sell the others to district cooperators in West Virginia and other States.

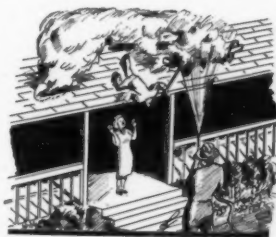


Jolliffe weeding. Some straw, but more sawdust, is used as mulch. The mulch is raked off after germination takes place.



FIREMEN RESOLVE.—By joint action, Delaware's Volunteer Firemen's Association and the Delaware Fire Chiefs' Association have unanimously adopted a resolution approving the work being done by the Soil Conservation Service and endorsing the program of Delaware's three soil conservation districts. It urges Delaware farm owners to construct farm ponds wherever a suitable site exists as part of their complete conservation farm plan, and opposes field burning as commonly practiced because it is dangerous and destructive to life and property.

The action of the associations, representing 52 fire companies with nearly 6,000 members serving every community in the State, was taken at the annual State convention at New Castle last fall.



THIS IS CONSERVATION, TOO!—W. A. Hallisey and R. J. Wagner, conservation surveyors in California, were making a routine survey in a sparsely settled part of San Mateo County when they noticed flames leaping from a farmhouse roof. They rushed to the house and attempted to warn any occupants. No one answered their calls. Wagner seized the fire extinguisher from their car and climbed onto the roof from a low porch. By that time the roof was ablaze in several places.

While Wagner was emptying his fire extinguisher on the largest blaze, Hallisey located a garden hose and coupled it to a nearby faucet. He passed the hose to Wagner and then located a wrecking bar which Wagner used to tear out flaming shingles as he played water on the burning roof.

Just as the fire was brought under control Mrs. Ralph Dale emerged from the house and looked with consternation at the remnants of the blaze. She had brought her husband home from the hospital earlier in the day and was attending him in a back room of the house and failed to hear the surveyors' call.



From R. Y. Bailey, famed agronomist of the South, comes this pastoral portrait with the sage comment: "This is a modern conservation farmer. He is a custodian of the Nation's land. With the help he gets through his soil conservation district, he is taking care of his land and making it better. He is producing abundant crops of food, fiber, and other commodities that help to keep this Nation strong."

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